

1. A ladder configured to be carried by at least one human user, said ladder comprising:
a plurality of legs, each defined by a first end and a second end;
a plurality of rungs disposed between said legs; and
a tip warning system comprising:
5 at least one of an audio alarm or a visual alarm;
 a power source to energize said at least one alarm;
 at least one weight sensor coupled to at least one of said plurality of legs or rungs;
 and
 a controller signally coupled to said at least one weight sensor such that upon
10 attainment of a predetermined signal threshold, said tip warning system
 provides notorious indicia to said human user through said at least one
 alarm.
2. The ladder of claim 1, wherein said at least one weight sensor is disposed adjacent said
15 first end.
3. The ladder of claim 2, wherein said at least one weight sensor is disposed beneath said
first end such that when said first end is placed upon a ladder-supporting surface, said at least
one weight sensor can measure a weight imposed thereon by at least said ladder.
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4. The ladder of claim 1, wherein said predetermined signal threshold is a sensed weight
that falls below a predetermined minimum.
5. The ladder of claim 1, wherein said at least one weight sensor comprises a plurality of
25 weight sensors.
6. The ladder of claim 5, wherein said predetermined signal threshold is an imbalance
measure between said plurality of weight sensors.
- 30 7. The ladder of claim 6, wherein said imbalance measure is a sensed difference that
exceeds a predetermined maximum.

8. The ladder of claim 6, wherein said imbalance measure is a sensed ratio that exceeds a predetermined maximum.

5 9. The ladder of claim 8, wherein said sensed ratio is a ratio of weight difference between said plurality of weight sensors divided by weight sum of said plurality of weight sensors.

10. The ladder of claim 1, wherein said controller comprises analog comparators.

10 11. The ladder of claim 1, wherein said controller comprises at least one digital microprocessor.

12. The ladder of claim 1, further comprising a movable counterbalancing weight coupled to said ladder, said counterbalancing weight responsive to said controller.

15 13. The ladder of claim 12, wherein said counterbalancing weight is mechanically adjustable.

14. The ladder of claim 12, wherein said counterbalancing weight is manually adjustable.

20 15. The ladder of claim 1, wherein said power source comprises a battery.

16. The ladder of claim 1, wherein said power source comprises a solar cell.

17. The ladder of claim 1, wherein said ladder is a stepladder.

25 18. The ladder of claim 1, wherein said ladder is an extension ladder.

19. The ladder of claim 1, wherein said at least one alarm comprises said audio alarm and said visual alarm.

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20. The ladder of claim 19, wherein at least one of said alarms is disposed adjacent said second end.

21. The ladder of claim 19, wherein said visual alarm comprises at least one light.

22. The ladder of claim 21, wherein said at least one light comprises a plurality of lights.

23. The ladder of claim 22, wherein each of said plurality of lights corresponds to particular ladder safety category.

24. The ladder of claim 23, wherein said plurality of lights comprise:
a first light to indicate at least one of system operational status or a first of said ladder safety category;
a second light to indicate a second of said ladder safety category; and
a third light to indicate a third of said ladder safety category.

25. The ladder of claim 19, wherein said visual alarm comprises at least one display.

26. The ladder of claim 1, wherein said at least one alarm comprises said audio alarm.

27. The ladder of claim 26, wherein said audio alarm comprises a buzzer.

28. The ladder of claim 27, wherein said buzzer is configured to vary an acoustic output that corresponds to particular ladder safety category.

29. The ladder of claim 28, wherein said varied acoustic output comprises:
a first sound to indicate at least one of system operational status or a first of said ladder safety category;
a second sound to indicate a second of said ladder safety category; and
a third sound to indicate a third of said ladder safety category.

30. The ladder of claim 29, wherein said first, second and third sounds comprise tones of successively higher frequency, respectively.

31. The ladder of claim 26, wherein said audio alarm comprises a prerecorded voice warning.

32. A tip-sensing ladder comprising:

a plurality of legs defined by a first end and a second end;

a plurality of rungs disposed between said legs to define a climbing path between said first and second ends; and

a tip warning system, said system comprising:

a plurality of weight sensors coupled to at least one of said plurality of legs or rungs;

a controller signally coupled to said weight sensors;

a plurality of alarms comprising an audio alarm and a visual alarm, said alarms

responsive to said controller such that upon attainment of a predetermined

signal threshold therein, at least one of said alarms activates; and

a power source to energize at least said plurality of alarms.

33. A method of using a ladder, said method comprising:

configuring a ladder to comprise:

a plurality of legs;

a plurality of rungs disposed between said legs; and

a tip warning system comprising:

an audio alarm and a visual alarm;

a power source to energize at least said audio and visual alarms;

at least one weight sensor coupled to at least one of said plurality of legs or rungs;

and

a controller signally coupled to said at least one weight sensor such that upon attainment of a predetermined signal threshold, said tip warning system provides notorious indicia to a

human user through at least one of said alarms;

placing said tip warning system in an operational condition;

placing said ladder against a ladder engaging surface;

climbing said ladder such that indicia is provided to a climber thereof to indicate at least one of an operational status or a ladder safety category.

- 5 34. The method of claim 33, wherein said ladder safety category comprises at least a first ladder safety category indicative of no imminent tipping and a second ladder safety category indicative of a possible tipping condition.